

**CLAIMS:**

1. An aircraft defueling fitting, comprising:  
  
first and second structural connectors, each of the first and second structural connectors having a first surface and a second surface;  
  
a circumferential seal disposed in the first surface of each of the first and second structural connectors;  
  
a mount extending between and connecting the first and second structural connectors;  
  
an actuator assembly disposed in the mount for opening an aircraft poppet valve.
2. An aircraft defueling fitting according to claim 1, further comprising a vacuum port disposed in each of the first and second structural connectors.
3. An aircraft defueling fitting according to claim 2 wherein each of the vacuum ports is operatively connected to a vacuum source at the second surface.
4. An aircraft defueling fitting according to claim 1, further comprising one or more fluid passages through the actuator assembly.
5. An aircraft defueling fitting according to claim 4 wherein the one or more fluid passages are in fluid communication with a vacuum source and a holding tank.
6. An aircraft defueling fitting according to claim 1 wherein the actuator assembly comprises a probe, a hub receptive of the probe, and a hub gasket.

7. An aircraft defueling fitting according to claim 6, further comprising an O-ring disposed around an end of the probe for sealing between the probe and the hub.

8. An aircraft defueling fitting according to claim 7, further comprising a baffle internal to the hub.

9. An aircraft defueling fitting according to claim 6, further comprising a removable insert disposed in the probe and extending through the baffle of the hub and through the hub gasket.

10. An aircraft defueling fitting according to claim 1 wherein the first and second structural connectors comprise suction cups.

11. An aircraft defueling fitting according to claim 10 wherein the suction cups and the mount comprise aluminum.

12. An aircraft defueling fitting according to claim 1 wherein the actuator is sized to open a recessed fuel tank poppet valve of an aircraft.

13. An aircraft defueling fitting according to claim 1 wherein the actuator is sized to open a fuel tank poppet valve of a Boeing C-17 aircraft when the first surfaces of the first and second structural connectors bear against a wing of the Boeing C-17.

14. An aircraft defueling fitting according to claim 1 wherein the mount is substantially straight.

15. An aircraft defueling fitting according to claim 1 wherein the mount is substantially V-shaped.

16. An aircraft defueling fitting, comprising:  
an elongated mount having first and second ends;  
a first suction cup attached to the first end of the elongated mount and a second suction cup attached to the second end of the elongated mount;  
a poppet valve opener attached to the elongated mount between the first and second ends.

17. An aircraft defueling fitting according to claim 16 wherein the elongated mount comprises an aperture, the poppet valve opener disposed in the aperture.

18. An aircraft defueling fitting according to claim 16 wherein the poppet valve opener comprises:  
a flanged hub having an internal passageway therethrough and an external trough;  
a probe inserted at least partially into the flanged hub;  
a hub gasket at least partially inserted into the external trough.

19. An aircraft defueling fitting according to claim 18, further comprising a removable insert of variable length disposed in the probe and extending through the flanged hub.

20. An aircraft defueling fitting according to claim 16 wherein each of the first and second suction cups comprises:

- a generally circular plate having a center, a first surface, a second surface, and a circumferential edge;

- a hole in the generally circular plate spaced from the center;

- a trough disposed in the first surface;

- a seal disposed in the trough.

21. An aircraft defueling fitting according to claim 20 wherein the circumferential edge comprises a concave surface, wherein an elastomeric ring is disposed around the circumferential edge against the concave surface.

22. An aircraft defueling fitting according to claim 20 wherein the hole comprises a vacuum suction port for sealing the first and second suction cups to an aircraft.

23. An aircraft defueling fitting according to claim 22 wherein the vacuum suction port is operatively connected to a vacuum source.

24. An aircraft defueling fitting according to claim 16 wherein the poppet valve opener comprises at least one fluid communication path therethrough.

25. An aircraft defueling fitting according to claim 16 wherein the poppet valve opener extends from the elongated mount such that the opener opens a recessed fuel valve of a Boeing C-17 aircraft when the first and second suction cups are sealed against a surface of the C-17 aircraft adjacent to the recessed fuel valve.

27. A defueling fitting for an aircraft, comprising:  
a mount having first and second ends;  
a first suction cup attached to the first end of the mount and a second suction cup attached to the second end of the mount;  
a fuel valve opener attached to the mount between the first and second ends;  
wherein the fuel valve opener extends transversely from the mount such that it reaches beyond and opens a fuel valve disposed behind an openable door of the Boeing C-17.

28. A defueling fitting for an aircraft according to claim 27 wherein each of the first and second suction cups comprises an aluminum plate with a vacuum port disposed therein.

29. An aircraft defueling fitting, comprising:  
an angled mount having first and second ends;  
a first connector attached to the first end of the angled mount and a second connector attached to a second end of the angled mount;  
a valve actuator assembly attached to the angled mount between the first and second ends adapted to open an aircraft fuel tank drain valve.

30. An aircraft defueling fitting according to claim 29 wherein the angled mount comprises a general V-shape, and the actuator assembly is attached at a vertex of the general V-shape.

31. An aircraft defueling fitting according to claim 29 wherein each of the first and second connectors comprises:  
a plate having a first surface, a second surface, and a circumferential edge;  
a hole in the plate;  
a continuous trough disposed in the first surface;  
a seal disposed in the trough.

32. An aircraft defueling fitting according to claim 31 wherein the circumferential edge comprises a concave surface, wherein an elastomeric ring is disposed around the circumferential edge against the concave surface.

33. An aircraft defueling fitting according to claim 31 wherein the hole comprises a vacuum suction port for attaching the first and second connectors to an aircraft.

34. An aircraft defueling fitting according to claim 33 wherein the vacuum suction port is operatively connected to a vacuum source.

35. An aircraft defueling fitting according to claim 29 wherein the valve actuator assembly extends from the angled mount such that the valve actuator opens the fuel tank drain valve of a Boeing C-17 aircraft when the first and second connectors are attached to a surface of the C-17 aircraft adjacent to the fuel tank drain valve.

36. A method for removing fuel from an aircraft fuel tank, comprising:  
providing first and second structural connectors, each of the first and second structural connectors having an inner surface and an outer surface, a circumferential seal disposed in the inner surface of each of the first and second structural connectors, a mount extending between and connecting the first and second structural connectors, and an actuator assembly disposed in the mount for opening an aircraft poppet valve of the aircraft fuel tank;  
depressing the aircraft poppet valve with the actuator.

37. A method for removing fuel from an aircraft fuel tank according to claim 36, further comprising applying a vacuum to the first and second structural connectors to seal the first and second structural connectors to the aircraft fuel tank.

38. A method for removing fuel from an aircraft fuel tank according to claim 36, further comprising draining fuel from the aircraft fuel tank through the actuator and into a holding tank.

39. A method for removing fuel from an aircraft fuel tank according to claim 38, further comprising applying a vacuum to the actuator to draw fuel from the aircraft fuel tank.

40. A method for removing fuel from an aircraft fuel tank according to claim 36, further comprising opening a fuel valve door of a Boeing C-17 aircraft.

41. A method for removing fuel from an aircraft, comprising:  
opening a fuel valve door;  
attaching a suction cup to the aircraft adjacent to the fuel valve door;  
depressing a fuel valve of the aircraft with an actuator attached to the suction cup.

42. A method for removing fuel from an aircraft according to claim 41, further comprising applying a first vacuum to the suction cup to seal the suction cup to the aircraft, and applying the first vacuum or a second vacuum to the actuator to draw fuel from the aircraft.



43. An aircraft defueling fitting, comprising:

a mount;

a suction cup attached to the mount;

a poppet valve opener separate from the first suction cup attached to the mount.

44. An aircraft defueling fitting according to claim 43 wherein the poppet valve opener comprises a flanged hub having an internal passageway therethrough and an external trough, a probe inserted at least partially into the flanged hub, and a hub gasket at least partially inserted into the external trough.

45. An aircraft defueling fitting according to claim 44, further comprising a removable insert of variable length disposed in the probe and extending through the flanged hub.

46. An aircraft defueling fitting according to claim 44 wherein the suction cup comprises:

a rigid plate having a center, a first surface, a second surface, and a circumferential edge;

a hole in the generally circular plate spaced from the center;

a trough disposed in the first surface;

a seal disposed in the trough.

47. An aircraft defueling fitting according to claim 46, further comprising at least one additional suction cup attached to the mount.